



## **AUDIT II**

# **Country Report** **SLOVAK REPUBLIC**

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## SUMMARY OF ENERGY AUDITING

### **Background and present National Policy**

The first energy audits were carried out in early 1990s, under various international technical assistance programmes such as the US programme SEED II or the EU PHARE-ENERGY programme, and were aimed upon transferring a systematic approach in the area of energy audits, with clearly specified goals and methods. Commercial base for energy audits was created with the entry of foreign investors in Slovak market.

The Energy Policy of the Slovak Republic was approved in January 2000 and has three main goals:

- the preparation on integration into the EU internal market,
- the security of the energy supply and
- sustainable development.

Accessing the EU asked for several measures: restructuring of the energy sector, a new principle of regulation in the energy sector, price adjustment liberalisation and the opening of the market accompanied by approximation to “acquis communautaire” of the EU.

The Slovak Republic as an EU-accession candidate is adjusting its legal framework to the “acquis communautaire” of the European Union. With regard to implementation of the EC Directive 93/76/EEC (SAVE), the Slovak Government decided on Dec. 12th, 2001 that the provisions of Art. 7 of this Directive should be implemented in an alternative, not mandatory way, i.e. an appeal of the Government to the industry to impose positions of energy managers and to monitor their energy consumption, whereas the creation of a market with energy audits has been left over to market forces and shall not be subject to state regulation.

Hence, until now, the energy audits have neither become a part of national climate strategy nor are a part of the State energy policy. For this reason, no state administration body could and would like to set the appraisal of energy audits as the energy service. Since there is no public order, the energy auditors are not methodically guided.

### **Energy Audit Programmes**

none

### **Other Programmes with Energy Audits**

Since 2000, there has been launched the **Programme for Support of Energy Savings and Utilisation of Alternative Energy Sources**, which aims upon supporting investments in the following areas

- Energy savings in flat houses and flats
- Utilisation of alternative energy sources
- Energy saving activities

by means of:

1. subsidies to reduction of interest rate load (up to 70 % or up to max. 4 Mio. SKK = approx. 92.000 €),
2. non-interest loan with a payback of max. 3 years (up to max. 3 Mio. SKK, approx. 69.000 €),
3. state guarantee for the loan (up to max. 4 Mio. SKK, approx. 92.000 €).

The application for support under the Programme has to include a preliminary energy audit, the scope of which is to assess the potential for energy savings related to the project implementation. The level of support depends then on the initially calculated energy savings. Project sites are examined by a second audit in order to verify the results one year after the implementation. Recipients of the support have a restriction of up to 250 employees, with a state share below 50%.

The main responsibility for the administration of the Programme lies with the Ministry of Economy SR, the Ministry of Finance SR and the Slovenska Záručná a Rozvojová Banka (Slovak Guarantee and Development Bank). The Slovak Government makes the principal decision on the total volume of funding, which is available for annual calls for proposals (annually 750.000 €).

The Slovak Energy Agency is acting as the implementing agency, entrusted to perform the evaluation and primary selection of projects, further to perform the monitoring audits for the projects and to make the evaluation. The payments/guarantees are divided in two parts, 50 % are payable after the project has been approved and the remaining 50 % are payable one year after project implementation. If the declared savings are not achieved, the support is correspondingly cut.

Neither total quantitative nor qualitative targets in terms of energy savings were set. The audits as a controlling instrument present the method of monitoring and provide the basis for evaluation. First projects under this Programme were implemented in 2001, hence the first monitoring audits are going to be performed in 2002.

### **Other Activities including Energy Audits**

none

## Energy Audit Programmes in SR

Energy Audit Programme
Other Programme related to Energy Auditing
Other Activity related to Energy Auditing

Industrial plants with high energy intensity	
Large industrial plants	
SME's	Programme for Support of Energy Efficiency and Utilisation of Alternative Energy Sources
Private service sector	
Public service sector	
Blocks of flats	
Small residential buildings	

Table of EAP features coverage (other programmes and other activities with energy audits)

	<b>Programme for Support of Energy Efficiency and Utilisation of Alternative Energy Sources</b>
<b>Status</b>	2000-
<b>Administration</b>	+++
<b>EA models</b>	+
<b>Auditors' tools</b>	++
<b>Training, authorisation</b>	+++
<b>Quality control</b>	++
<b>Monitoring</b>	+
<b>Volumes, results</b>	+++
<b>Evaluation</b>	+++

+++ = Detailed information available  
 ++ = Some information available  
 + = Very little information available  
 = No information available / does not exist

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## Country Report

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## Disclaimer

The information contained in this report has been gathered from publicly available sources and through interviews. All efforts have been made to secure the veracity of the report, however the authors cannot guarantee the content.

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## COUNTRY REPORT

### 1. Background and present National Policy

#### 1.1 Previous activities

In early 1990s, the first energy audits were performed in industrial companies under the US programme SEED II. A continuation presented the PHARE-ENERGY programme B1/91, which was directed towards administrative buildings as well as the PHARE-ENERGY programme B2/91, which was targeted towards the pulp, paper and glass manufacturing companies. Both programmes aimed upon setting a systematic approach in the area of energy audits, with clearly specified goals and methods.

Further systematic implementation of energy audit schemes presented between 1992-1998 the “Programme for promotion of energy savings in residential housings and flats” and the “Programme for promotion of economic activities aiming upon energy savings and reduction of raw material imports”, which was related to industrial companies. The level of support depended on the calculated achievable energy savings. Under provisions of these programmes, the application for support had to include a preliminary energy audit, based on the available project documentation. The main scope of this initial audit was to assess the proclaimed energy savings potential.

Between 1994-1996, a number of audits in industrial sector was coordinated by the Canadian company Power Smart Inc. The Power Smart programme assessed especially the possibilities for power savings in industry.

During the period 1995 – 1997, further wave of complex energy audits in industry, especially pulp, paper and breweries, was performed under the SAVE project “Monitoring and Targeting“, which was coordinated by the company March Consulting, UK.

Since mid 1990s and especially since 2000, there have been elaborated complex or energy media (heat, light, power, natural gas, coal, etc.) oriented, topical energy audits in municipalities. These audits have been ordered by the institutions financing energy investments (ESCOs, banks, GEF, etc.) and were produced by both foreign and Slovak consulting companies. The Slovak Energy Agency with its four regional offices was strongly involved.

As a further step, in frame of the programme PHARE-ENERGY „Regional Energy Studies“ as well as on the basis of the decision of the Government of the Slovak Republic from 1998 on the need for elaboration of regional energy conceptions, there were carried out energy audits in the regions Košice, Prešov and Trenčín.

Between 1998-2000, specific energy audits for utilisation of CHP were carried out in industrial companies and public sector e.g. healthcare facilities, in frame of the Cogeneration Centre project, which was implemented by the Slovak Energy Agency and the Austrian consortium Agiplan/Verbundplan under the auspices of the Austrian-Slovak Energy Partnership. These audits were subsidized, as the Austrian experts were financed by the Austrian Federal Chancellor Office.

From 1997 to 2000, the energy audits were supported also by means of the **Energy Saving Fund**, financed by **PHARE/EBRD**. The main idea was to create a revolving instrument for providing of low cost loans for energy efficiency projects. EU-PHARE, Slovak Government, Ministry of

Economy, the Slovak Energy Agency and the Priemyselná banka were involved in selection of the projects and administration of the Fund. In the first step, large companies, which were interested in implementation of energy efficiency projects and wanted to receive financing from the Fund, had to undergo a project tender procedure. Their creditworthiness as well as the basic parameters of proposed project ideas (energy savings, payback under 3 years) presented the main criteria for allocation of funding. Approx. 15 companies, which successfully passed the tender were examined in detail by means of energy audits, which exactly stated the main savings potential, the measures for its exploitation as well as the economic parameters (e.g. pay back) of the proposed investments. The costs of the audit became a part of the overall project implementation costs, which were financed by means of loans charged with only a small interest rate. The revolving ability should have been ensured by a maximum 3 years payback period of the projects, which should result in 3-year repayment of loans. Each year, 4-5 companies were selected for implementation of the respective measures, with the main idea to create a revolving mechanism. After 3 years, in which the fund was used rather moderately (only approx. 1 Mio € instead of the originally 10 Mio €), PHARE cut its support and redirected it to other countries because of low revolving ability. Due to this reason, the Fund was “frozen” for several years.

## 1.2 Present national policy

The *Energy Policy of the Slovak Republic* was approved in January 2000 and lays down three main goals:

- the preparation on integration into the EU internal market,
- the security of the energy supply and
- sustainable development.

Accessing the EU asked for several measures: restructuring of the energy sector, a new principle of regulation in the energy sector, price adjustment liberalisation and the opening of the market accompanied by approximation to *acquis communautaire* of the EU.

The basic energy legislation was adopted, i.e. Act on Conducting Business in the Energy sector, shortly Energy Act, No. 70/1998 CoL., which was novelised in 2001 and Act No.130/1998 on peaceful utilisation of nuclear energy. The adopted Slovak legislation takes into account the principles included in international documents as Energy Charter Treaty, Protocol of Energy Charter on energy efficiency and related environmental aspects, Nuclear Safety Treaty, United Nation Framework Convention on Climate Change and it approximates fully or partly also legislative framework valid in European Union.

With reference to the Energy Act, an individual area of energy efficiency assessment via shortened audits present the mandatory regular annual inspections of heat sources and heat distribution systems, which are delivering heat to the households. For this activity, there was established a functioning system of heat system controllers and data processing. The output presents a so-called “Attest on efficiency of heat device system operation” which sets the operation normatives and enables also the assessment of CO<sub>2</sub> emissions. However, these shortened assessments of energy efficiency can not be considered as an example of classic energy audits.

The Act No. 276/2001 on Regulation of Network Industries constituted the Office for Regulation of Network Industries (Regulator), which is setting new principles for regulation in all network industries, including the energy sector. As a result of this, most competences in the area of



licensing, planning and pricing of energy moved from other central administration bodies to the Regulator.

The issue of energy efficiency and renewable energy sources has legal basis mainly in the *National Programme for Reduction of Energy Intensity and Utilisation of Renewable Energy Sources*, which was approved by the government of the Slovak Republic in form of the Government decision No. 1055/1999. This document was going out of the State energy policy principles and contained also a list of measures on legal, institutional a normative level in order to foster the energy efficiency in private as well as in public sector of Slovakia. The catalogue of proposed measures included also the elaboration of an energy efficiency framework act, which would lead to also to establishment of clear and sound rules for energy planning and involved also the position of energy auditors, together with definition of the energy audit term.

### 1.3 Legal position of energy audits

The Slovak Republic as an EU-accession candidate goes through a period of adjusting its legal system to the “acquis communautaire” of the European Union. Hence, the proposal of Energy Efficiency Act was aiming also upon approximation to the relevant EU directives governing energy efficiency issues. The EC Directive 93/76/EEC of 13.9.1993 on reduction of CO<sub>2</sub> emissions by means of improving energy efficiency (SAVE – Directive) obliges in its Art. 7 the Member States to implement energy audit programmes for large industrial consumers of energy. The Draft of Energy Efficiency Act therefore proposed to impose for large industrial companies an obligation to carry out energy audits every 2 res. 5 years. Furthermore, the proposal of Energy Efficiency Act included precise definitions of energy auditor position, qualification, competences, duties and rights.

However the Energy Efficiency Act should have led neither to growth of administration and buerocracy apparatus nor to increase of duty burden for the private sector. If the energy audit were understood as an additional administration step, its effects would be minimised. Besides of this, due to rapid development of secondary legislation, the need for passing the Energy Efficiency Act diminished. Therefore, on Dec. 12th, 2001, the Slovak Government decided that the provisions of Art. 7 of this directive should be implemented in an alternative, not mandatory way, i.e. an appeal of the Government to the industry to impose positions of energy managers and to monitor their energy consumption.

If the private companies decide not to create special positions of energy managers or are interested in obtaining a view from outside, they should have the opportunity to contact energy auditors. In this case it will be free decision of the company, which does not have to be anchored in law and hence does not present an administrative obligation which would be met without having real benefit to the company.

Creation of a market with energy audits has been left over to market forces and shall not subject to state regulation. Nevertheless, in order to accelerate this process, the state shall provide motivation incentives fostering the development of energy audit market. The EU considers as sufficient meeting of provisions of the respective Directive if the state would launch an appeal targeted towards private sector to create positions of energy managers and to include in the annual reports also an information on energy consumption. As a further supporting instrument, there should be established an online database of energy auditors and their references and there should be also more

PR from the side of Ministry of Economy of SR in this area. If the energy consumption pattern is not affected, it will still be possible to set stricter measures.

## **1.4 Present status**

Until now, the energy audits have not become a part of national climate strategy. Since by now, there does not exist any interaction between the Ministry of Economy, Ministry of Environment and the Office for regulation of network industries (since 1.8.2001 responsible for energy efficiency of heat sources). The audits are neither a part of the State energy policy.

For this reason, no state administration body could and would like to set the appraisal of energy audits as the energy service product. Because of this, it is not possible to state, whether there exists relations among:

- AM and audit costs,
- duration of energy audit,
- energy consumed or revealed saving potentials,
- financial support of energy audits.

Since there is no public order, the energy auditors are not methodically guided. Nevertheless, the Slovak Energy Agency is successfully organising trainings and seminars on the basis of actual interest for this topic.

Methodical guiding of energy auditors is systematically carried out only for employees of the Slovak Energy Agency, which has elaborated materials for processing of energy audits in form of manuals (methodical and working instructions).

## **1.5 Future development**

The energy audits as a separate topic should be dealt with within the World Bank project: National Energy Efficiency Study for SR, which is presently elaborated as a basic document for decision making at the Ministry of Economy. Since the energy audits should become a part of the measures recommended under the Energy Efficiency Action Plan, which is a recommending tool, the project team was considering to propose mandatory energy audits for large consumers of energy (over 20 GJ) in the following categories: buildings, small and medium enterprises and industry.

According to the latest information (03.05.02), following the discussions with the Ministry of Economy SR and the Slovak Energy Agency, with regard to the above stated position, namely that the state does not intend to increase the administrative burden for the private sector by imposing mandatory measures, unless they are necessary, it was proposed to launch Energy Audit Programme, which should enable the co-financing of energy audits carried out in selected sectors. The proposed sources of finance should present the state budget as well as the Structural Funds in the future.

With regard to other instruments for support of energy savings, which are potentially available, further utilisation of the above mentioned funding via PHARE Energy Saving Fund is also taken into consideration. Currently, the original 1 Mio €, which was borrowed 4 years ago, is being repaid from the achieved savings back to the Fund and could be used for financing of new energy efficiency projects. According to the Ministry of Economy SR, this finance could be used in future for financing of projects in the public sector. The decision is now by PHARE.

## **2. Energy Audit Programmes**

At the present time, there is no specific programme in Slovak Republic, which would be used to direct support of audits only. Nevertheless, the energy audits are directly integrated in instruments for support of energy efficiency and RES and it is planned for the future to launch real Energy Audit Programmes, which will be backed by the Structural Funds.

## **3. Other Programmes related to Energy Auditing**

### **3.1 Programme for Support of Energy Savings and Utilisation of Alternative Energy Sources**

Since 2000, the “Programme for promotion of energy savings in residential housings and flats” and the “Programme for promotion of economic activities aiming upon energy savings and reduction of raw material imports” have been integrated in a single state funded scheme, the “Programme for Support of Energy Savings and Utilisation of Alternative Energy Sources”.

The Programme for Support of Energy Savings and Utilisation of Alternative Energy Sources (further referred to as the Programme) presents a tool for stimulation of realization of the projects, that are targeted towards increase of energy efficiency at energy producer and consumer levels as well as towards utilisation of alternative energy sources by providing subsidies, guarantees and returnable financial support.

The Programme aims upon supporting energy rationalisation investments by means of:

1. subsidies to reduction of interest rate load (up to 70 % or up to max. 4 Mio. SKK = approx. 92.000 €),
2. non-interest loan with a payback of max. 3 years (up to max. 3 Mio. SKK, approx. 69.000 €),
3. state guarantee for the loan (up to max. 4 Mio. SKK, approx. 92.000 €).

The level of support depends on the calculated achievable energy savings. Under provisions of these programmes, the application for support has to include a preliminary energy audit, based on the available project documentation. The main scope of the initial audit was the assessment of the potential energy savings resulting from the project implementation. One year after the implementation, the projects are assessed by a second audit in order to verify the achieved results.

#### **3.1.1 Programme goals**

There exist no concrete quantitative targets neither on national nor on regional level.

The programme is supporting projects included to one of three groups:

##### **a. Energy savings in flat houses and flats**

E.g. Buying and installation of regulation equipment in order to ensure an energetically efficient operation in flat houses and flats, reconstruction of heat sources supplying flat houses, mostly by utilization of boiler condensation equipment and implementation of cogeneration units in range of up to 10 MWe of output, optimisation of district heating systems.

**b. Utilization of alternative energy sources**

E.g. Construction of small hydro-power stations, energy efficient utilization of biomass, utilization of heat pumps, installation of solar collectors, utilization of geothermal energy, utilization of wind energy.

**c. Energy saving activities**

E.g. Implementation of modern facilities and technologies used by their buyers to achieve energy savings or usage of alternative energy sources, fuels and energy consumption rationalization (reconstruction of heat sources, heat systems or technology processes), replacement of fossil fuels, particularly facilities for biomass processing and utilisation.

**3.1.2 Target sectors**

The Programme is targeted mainly towards the district heating systems by means of improving the efficiency of heat production (reconstruction of sources) and heat distribution (hydraulic regulation), as well as for regulation of heat consumption in flat buildings. Funding from the Programme can be also used for projects in individual residential housings. Recipients of the support are dwelling associations, flat companies, associations of flat owners, municipalities, owners or operators of flat houses and heat sources supplying the citizens by heat registered in the area of SR as well as small and medium sized enterprises (industry and services) with a restriction of up to 250 employees and a state share not exceeding 49%.

**3.1.3 Administration**

The main responsibility for the administration of the Programme lies with the Ministry of Economy SR, the Ministry of Finance SR and the Slovenska Záručná a Rozvojová Banka (Slovak Guarantee and Development Bank). The allocation of the funding in frame of the Programme is done by the Project Selection Council, which includes representatives of the Ministry of Economy SR, Ministry of Finance SR, Ministry of Construction and Regional Development SR, Slovak Energy Agency, Slovenska Záručná a Rozvojová Banka, Association of Employers' Unions SR, Association of Entrepreneurs SR, NGOs. Funding is coming from the state budget (30 Mio SKK = approx. 750.000 €) via the Ministry of Finance. The Slovak Government makes the principal decision on the total volume of funding, which is available for annual calls for proposals.

The Slovak Energy Agency is acting as the implementing agency, entrusted to perform the evaluation and primary selection of projects, further to perform the monitoring audits for the projects and to make the evaluation. The payments/guarantees are divided in two parts, 50 % are payable after the project has been approved by the Project Selection Council and remaining 50 % are payable one year after project implementation. Here the Slovak Energy Agency verifies, whether the declared goals of the project stated in the energy audit have been matched. If the declared savings are not achieved, the support is correspondingly cut. Hence, the energy audits are condition for participation in the call for proposals as well as for monitoring.

Essential for successful implementation of the Programme are dissemination of information, marketing and increasing awareness. The Ministry of Economy SR and the Slovak Energy Agency have taken several dissemination activities via presentations at various events, seminars and conferences as well as on their homepages.

### **3.1.4 Implementing Instruments for Energy Audits**

#### **Mandatory/Legal Schemes**

The mandatory schemes were included into proposal of the Energy Efficiency Act. Basically, the idea of mandatory audits at the level of large energy consumers is correct, but on the other side, the way of implementation, stating in the Act proposal the position of energy auditor, his duties/rights, liability etc. according to provisions valid in the taxation and accounting standards, was not a lucky one. Based on this, it was decided to left over the energy auditing to free market forces.

#### **Voluntary Schemes**

There are no voluntary schemes/agreements in place by now. The Slovak Government approved the Decree No. 1052/1999, which included the Task to initiate the debate on voluntary agreements in the area of energy efficiency with market participants res. their associations. The problem was basically the way, in which Ministry of Economy presented the issue to the associations, which resulted e.g. in refusal of the whole energy efficiency topic by the Industrial Unions. The negative attitude of Industrial Unions was strengthened by the traditional aversion towards anything new.

#### **Fiscal incentives**

No energy audit condition is necessary for obtaining tax allowances relating to energy efficiency or RES. An input in this way could be expected from the newly established Regulatory office.

As described above, main instrument presents currently the Programme for Support of Energy Savings and Utilisation of Alternative Energy Sources. Energy audits are mandatory part of the application for support under the Programme. Costs relating to elaboration of energy audits are carried by the organisations asking for support under the Programme. If the projects are evaluated positively, the costs can be added to Project documentation costs and as such subject to support from the Programme.

This way to introduce energy audits, namely in view and in course of the opportunity to gain the low cost financing, was more motivational and has basically a better reflection than imposing mandatory audits. Since also the latter possibility would be possible in SR.

#### **Marketing oriented schemes**

The general director of the Slovak Energy Agency was entrusted by the Minister of Economy of the Slovak Republic to promote the Programme as a personal task.

By now, no other concrete schemes are launched in the Slovak Republic, nevertheless there is a number of separated actions, which are not primarily oriented solely towards the energy audits. The new conceptions for marketing of energy efficiency and RES are to be elaborated on the basis of the currently processed National Energy Efficiency Study SR, which is financed by the World Bank. The responsibility for elaboration of the conceptions lies with the Ministry of Economy. The foreseen deadline is July 2002.

#### **Policy issues**

The energy audits are not directly mentioned in principal documents as, i.e. the current Energy Policy of the Slovak Republic. At the time of Energy Policy preparation, the idea was to include the energy audits into the proposal of Energy Efficiency Act, which, however, was not approved. The presently prepared National Energy Efficiency Study SR with the new energy efficiency and RES conception should improve this status. The only legal document dealing with energy audits presents the list of measures in the Decision of Government No.1055/1999 on the National Programme for Reduction of Energy Intensity and Support of Utilisation of Renewable Energy Sources including R&D in this area.

**Table 1:** Overview of implementing instruments

<b>Mandatory / legal schemes</b>	<b>Voluntary schemes</b>
No mandatory/legal schemes related to support of energy audits.	No voluntary schemes related to support of energy audits.
<b>Fiscal incentives (taxes)</b>	<b>Fiscal incentives (subsidies)</b>
No fiscal incentives related to support of energy audits.	No direct subsidies related to support of energy audits but energy audits as mandatory part of the applications for support from the Programme (see text)
<b>Marketing oriented schemes</b>	<b>Policy issues</b>
The Slovak Energy Agency and the Ministry of Economy promote the Programme by means of presentations, articles and their web pages.	Neither Energy Policy of SR nor the Climate Change Reports deal with energy audits. These are mentioned only in the Decision of Government No.1055/1999 on the National Programme for Reduction of Energy Intensity and Support of Utilisation of Renewable Energy Sources including R&D in this area.

### 3.1.5 Energy Audit Tools and Models

The proceeding for elaboration of the initial energy audits in frame of the Programme are not specified, and the applicants have the right to choose the company carrying out the audit according to own rules. The technical consultant SEA has just to evaluate the assumptions concerning the benefits resulting from implementation of the proposed project which are stated in the audit. The monitoring audits are performed by the SEA staff on the basis of the Recommending Methodology for Energy Audit, which is a complex tool and covers all basic aspects of an energy audit, its structure and reporting and can be used general (industry, district heating, buildings).

#### Energy Audit Tools and Models for Industry

There is no mandatory audit tool or model, nevertheless the energy audits performed by the SEA staff in industry in district heating schemes are carried out in compliance with the Recommending Methodology for Energy Audit.

The Recommending Methodology is applicable to industrial processes, generation and distribution of heat (DHS) and buildings and was developed by professionals acting in the energy audits and is based on application of the Danish and French know-how, which was transferred to Slovakia under the PHARE programme.

This complex tool covers all basic aspects of elaboration of an energy audit and does not consider only energy transformation and efficiency of energy production and distribution device operation, but include also technical-economic possibilities for utilisation of alternative energy sources, incl. reporting. It presents a binding tool for SEA staff and is recommended to all attendants of energy auditor courses organised by Energy Institute of the Slovak Energy Agency.

The Methodology is used since 1996 and in case of industrial energy audits, this Model involves also energy consumption of the production process technologies.

The Methodology has the form of a guidebook, which is available for free for the participants of the energy auditor courses organised by the Energy Institute of the Slovak Energy Agency. The Methodology includes also technical-economic possibilities for utilisation of alternative energy sources. This industry energy audit model includes auditing of the production process, auditing of the energy production on site (heat, power, CHP) and measurements on energy use.

### **Energy Audit Tools and Models for Buildings**

No compulsory or binding tool/model is in place. The tool recommended by the Energy Institute of the Slovak Energy Agency is the publication „Energy audit of buildings“, which basically adopts the ENSI model for Slovak conditions. Most of the energy audits for buildings are performed according to this tool.

The ENSI model is used basically for administrative buildings, in public and tertiary sector, whereas the Recommending Methodology can be used for energy audits in mainly residential buildings, involving also the heat delivery systems and final heat consumption devices.

The Energy Audit in Buildings is an application of Norwegian ENSI system and was elaborated by Prof. Petráš, Construction Faculty, Slovak Technical University, the President of the Slovak Society for Building technology. This model has been in use for 6 years, the manual Energy Audit in Buildings can be obtained on commercial basis by order at JAGA Bratislava publishing

#### **3.1.6 Training, authorisation, quality control**

The Energy Auditor training, which is organised by the Energy institute of the Slovak Energy Agency, consists of 110 hours of lectures, which are presented by 35 lecturers. One course is divided up into four blocks, each lasting for 3-4 days. The course covers the following range of topics: technical and legal aspects of heat and power generation and distribution, cooling, drying, air-condition, lighting, measuring and regulation equipment, financing possibilities for energy efficiency measures (banks and non banking organisations or programmes), basic economic terms, entrepreneurship, management.

The lecturers advise the participants to proceed according to the Recommending Methodology for Energy Audits, issued by the Slovak Energy Agency, which is provided to all participants free of charge. For energy audits in buildings, the recommended literature presents the publication Energy Audit in Buildings, issued by Prof. Petrás, which can be purchased. Furthermore, the future auditors are recommended to use specific measuring equipment, soft- and hardware.

The participants of energy auditor courses have to have finished higher education (higher industrial schools or any university), and have to prove that they have been working in the energy sector for min. 5 years

Since 1996, there have been organised 9 courses, each consisting of 4 blocks. The total number of absolvents presents 328 auditors and an update training is currently being considered by the Energy institute.

Regarding the further actions, this year, there took place an “Energy Audit” conference in frame of the annual Racioenergia fair, to which all participants of energy auditor course were invited.

No quality control in terms of ISO 9000 procedures is in place. On the other hand, the course participants are asked to fill a feedback questionnaire, which refers to the lecture topics, the quality of lecturers and to course organisation itself. This mechanism helps to improve the course quality.

### **Authorisation**

Since the Energy Efficiency Act was not passed, energy audits can be performed by all privates and legal entities in SR.

With regard to the organisation of energy auditor courses, the Energy Institute of the Slovak Energy Agency received authorisation to perform this activity from the Ministry of Scholarship of the SR.

The attendees of the energy auditor courses, who pass the final exam, receive an Energy Auditor Certificate, which contains their name and registration number. The records are kept by the Energy Institute of the Slovak Energy Agency.

### **Quality Control**

The control takes place in order to provide the clients with reliable information. As for external auditors, no control mechanism was established by now. As for the energy auditor course, the quality control is performed by its participants by means of the feedback questionnaires and by the management of EI SEA.

For the SEA auditors, there is in place an internal quality control mechanism, which includes the consultation of the individual topics /expert fields covered by the audit, a check with the Recommending Methodology as well as a comparison of the total output with similar audits. Especially checked are the saving potentials, payback times and concepts presented in energy audit reports. In this way, the SEA staff receives a competent feedback.

The control usually involves two persons per audit, the number of man-months depends on the number of the extent of the audit and on the number of audits. Yearly approximately 25 audits are checked within the SEA. The quality varies with the data which were collected at the beginning of the audit. The quality control does not depend on any subsidy payments.

### **3.1.7 Results, Monitoring and Evaluation**

Neither total quantitative nor qualitative targets for the Programme for Support of Energy Savings and Utilisation of Alternative Energy Sources as a whole were set. With regard to the fact, that audits are considered as a controlling instrument on the success of the Programme, these present actually the method of monitoring and provide the basis for evaluation. The first projects under this Programme were implemented in 2001, hence the first audits are going to be performed within this year. By now, the costs can not be generalised, but it can be stated that these depend primarily on the extent of the audit.

Nowadays, the Slovak Energy Agency collects data on actual measured savings for each individual project, which asked for support from the Programme and assesses the site one year after implementation of the project.

Basically, the collection of data is related to statement of energy flow balances and – in case of industrial audits, also the data on the production technology are collected. As for quality of the data as well as with reference to the fact, that the monitoring audits are needed only once per project: if



the operation measuring equipment is installed, it is possible to use outcome of continuous measurements, this depends however on the archivation of data. Otherwise, data for certain period (most frequently one year) are used. The techniques depend on the individual audit, e.g. in many cases the efficiency of boilers is stated by the indirect method – on the base of flue gas analysis, in other cases, it is possible to perform also long term measurements of power consumption. In most cases, the monitoring and evaluation is based on already installed operation measurers.

In general, the responsibility for the archived data from operation measuring equipment lies with the audited company, the auditors have to verify the data. Otherwise, if the auditor is performing the measurements, he takes the responsibility for data. The information gained from the audit should be used to verify the compliance with the proclaimed energy savings, which were stated in the original project.

For the Programme for Support of Energy Savings and Utilisation of Alternative Energy Sources, there exist summary reviews stating the projects supported, height of support and savings declared – these are based on the initial audit results. The compliance or non compliance with these declared values is now going to be proven for the first set of projects.

For each project funded from the Programme for Support of Energy Savings and Utilisation of Alternative Energy Sources, there will exist an individual monitoring report, based on the monitoring audit on Comparison between the initially declared and actually achieved savings, involving the statement of compliance or not compliance with the terms under which the support was granted.

#### **4. Other Activities related to Energy Auditing**

No other activities exist so far.